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☑ Final Report
☐ Revised Report

Report Date:
04-Dec-18 17:11

Laboratory Report
SC51970

Gulf Oil L.P.
281 Eastern Avenue
Chelsea, MA 02150
Attn: Andrew P. Adams

Project: Gulf Terminal - Chelsea, MA
Project #: [none]

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Dawn Wojcik
Laboratory Director

Dawn E Wojcik

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 13 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our Quality web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Sample Summary

Work Order: SC51970

Project: Gulf Terminal - Chelsea, MA

Project Number: [none]

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC51970-01	Outfall 003	Surface Water	15-Nov-18 07:35	15-Nov-18 16:00
SC51970-02	TB-1/-2	Trip Blank	15-Nov-18 00:00	15-Nov-18 16:00

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 0.6 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group. If method or program required MS/MSD/Dup were not performed, sufficient sample was not provided to the laboratory.

Analyses for Total Hardness, pH, and Total Residual Chlorine fall under the state of Pennsylvania code Chapter 252.6 accreditation by rule.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

Samples:

SC51970-01 *Outfall 003*

The pH of this sample has been adjusted in the laboratory for the tests listed below in accordance with the preservation requirements of the applicable methods.

Oil & Grease

SW846 8270D SIM

Calibration:

1810044

Analyte quantified by quadratic equation type calibration.

Benzo (a) pyrene

This affected the following samples:

1815132-BLK2
1815132-BS2
1815132-BSD2
Outfall 003
S822832-ICV1
S823339-CCV1
S823372-CCV1

Laboratory Control Samples:

1815132 BS/BSD

Naphthalene percent recoveries (30/45) are outside individual acceptance criteria (40-140), but within overall method allowances. All reported results of the following samples are considered to have a potentially low bias:

Outfall 003

1815132 BSD

Naphthalene RPD 40% (20%) is outside individual acceptance criteria.

Samples:

S823339-CCV1

SW846 8270D SIM

Samples:

S823339-CCV1

Analyte percent drift is outside individual acceptance criteria (20), but within overall method allowances.

Benzo (a) pyrene (20.1%)

This affected the following samples:

1815132-BLK2
1815132-BS2
1815132-BSD2
Outfall 003

Sample Acceptance Check Form

Client:	Gulf Oil L.P.
Project:	Gulf Terminal - Chelsea, MA / [none]
Work Order:	SC51970
Sample(s) received on:	11/15/2018

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC51970-01 **Client ID:** Outfall 003

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Total Suspended Solids	62.0		1.7	mg/l	SM2540D (11)

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Outfall 003 SC51970-01	[none]	Surface Water	15-Nov-18 07:35	15-Nov-18

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
50-32-8	Benzo (a) pyrene	< 0.049		µg/l	0.049	0.020	1	SW846 8270D SIM	16-Nov-18	20-Nov-18	MSL	1815132	
91-20-3	Naphthalene	< 0.049		µg/l	0.049	0.021	1	"	"	"	"	"	
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*37*			*30-130 %*			"	"	"	"	"	
Extractable Petroleum Hydrocarbons													
Prepared by method General Preparation SVOC													
	Oil & Grease	< 1.00	OG	mg/l	1.00	0.915	1	EPA 1664B	30-Nov-18	30-Nov-18	JB	1815623	X
General Chemistry Parameters													
	pH	**6.81**	pH	pH Units			1	ASTM D 1293-99B	15-Nov-18 17:30	15-Nov-18 18:00	BD	1815130	X
	Total Suspended Solids	**62.0**		mg/l	1.7	0.7	1	SM2540D (11)	20-Nov-18	21-Nov-18	CMB	1815266	X
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW8260C													
*Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007*													
71-43-2	Benzene	< 0.50		ug/l	0.50	0.50	1	SW8260C	15-Nov-18 07:35	16-Nov-18 22:07	M-CT007	456843A	
91-20-3	Naphthalene	< 1.0		ug/l	1.0	1.0	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
TB-1/-2 SC51970-02	[none]	Trip Blank	15-Nov-18 00:00	15-Nov-18

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Subcontracted Analyses													
Subcontracted Analyses Prepared by method SW8260C													
*Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007*													
71-43-2	Benzene	< 0.50		ug/l	0.50	0.50	1	SW8260C	15-Nov-18	16-Nov-18 21:46	M-CT007	456843A	
91-20-3	Naphthalene	< 1.0		ug/l	1.0	1.0	1	"	"	"	"	"	

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8270D SIM										
Batch 1815132 - SW846 3510C										
Blank (1815132-BLK2)						Prepared: 16-Nov-18 Analyzed: 20-Nov-18				
Benzo (a) pyrene	< 0.050		µg/l	0.050						
Naphthalene	< 0.050		µg/l	0.050						
Surrogate: Benzo (e) pyrene-d12	*0.350*		µg/l		*1.00*		*35*	*30-130*		
LCS (1815132-BS2)						Prepared: 16-Nov-18 Analyzed: 20-Nov-18				
Benzo (a) pyrene	**0.457**		µg/l	0.050	1.00		46	40-140		
Naphthalene	**0.305**	QM9	µg/l	0.050	1.00		30	40-140		
Surrogate: Benzo (e) pyrene-d12	*0.320*		µg/l		*1.00*		*32*	*30-130*		
LCS Dup (1815132-BSD2)						Prepared: 16-Nov-18 Analyzed: 20-Nov-18				
Benzo (a) pyrene	**0.533**		µg/l	0.051	1.02		52	40-140	15	20
Naphthalene	**0.458**	QR5	µg/l	0.051	1.02		45	40-140	40	20
Surrogate: Benzo (e) pyrene-d12	*0.439*		µg/l		*1.02*		*43*	*30-130*		

Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
EPA 1664B										
Batch 1815623 - General Preparation SVOC										
Blank (1815623-BLK1)						Prepared & Analyzed: 30-Nov-18				
Oil & Grease	< 1.04		mg/l	1.04						
LCS (1815623-BS1)						Prepared & Analyzed: 30-Nov-18				
Oil & Grease	**32.7**		mg/l	1.04	41.5		79	78-114		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
ASTM D 1293-99B										
Batch 1815130 - General Preparation										
Reference (1815130-SRM1)						Prepared & Analyzed: 15-Nov-18				
pH	**6.02**		pH Units		6.00		100	97.5-102.5		
Reference (1815130-SRM2)						Prepared & Analyzed: 15-Nov-18				
pH	**5.99**		pH Units		6.00		100	97.5-102.5		
SM2540D (11)										
Batch 1815266 - General Preparation										
Blank (1815266-BLK1)						Prepared: 20-Nov-18 Analyzed: 21-Nov-18				
Total Suspended Solids	< 0.5		mg/l	0.5						
LCS (1815266-BS1)						Prepared: 20-Nov-18 Analyzed: 21-Nov-18				
Total Suspended Solids	**100**		mg/l	10.0	100		100	90-110		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW8260C										
Batch 456843A - SW8260C										
BLK (CB99008-BLK)						Prepared:	Analyzed: 16-Nov-18			
Naphthalene	**ND**		ug/l	1.0			ND	-		
Benzene	**ND**		ug/l	0.70			ND	-		
LCS (CB99008-LCS)						Prepared:	Analyzed: 16-Nov-18			
Naphthalene	**19.08**		ug/l	1.0	20		95	70-130		30
Benzene	**19.52**		ug/l	0.70	20		98	65-135		20
LCSD (CB99008-LCSD)						Prepared:	Analyzed: 16-Nov-18			
Naphthalene	**20.06**		ug/l	1.0	20		100	70-130	5.1	30
Benzene	**19.49**		ug/l	0.70	20		97	65-135	1.0	20
MS (CB99008-MS)			**Source: CB99008**			Prepared:	Analyzed: 16-Nov-18			
Benzene	**18.77**		ug/l	0.70	20		94	37-151		20
Naphthalene	**15.55**		ug/l	1.0	20		78	70-130		30
MSD (CB99008-MSD)			**Source: CB99008**			Prepared:	Analyzed: 16-Nov-18			
Benzene	**20.90**		ug/l	0.70	20		104	37-151	10.1	20
Naphthalene	**19.56**		ug/l	1.0	20		98	70-130	22.7	30

Notes and Definitions

QM9	The spike recovery for this QC sample is outside the established control limits. The sample results for the QC batch were accepted based on LCS/LCSD or SRM recoveries within the control limits.
QR5	RPD out of acceptance range.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
OG	The required Matrix Spike and Matrix Spike Duplicate (MS/MSD) for Oil & Grease method 1664B can only be analyzed when the client has submitted sufficient sample volume. An extra liter per MS/MSD is required to fulfill the method QC criteria. Please refer to Chain of Custody and QC Summary (MS/MSD) of the Laboratory Report to verify ample sample volume was submitted to fulfill the requirement.
pH	The method for pH does not stipulate a specific holding time other than to state that the samples should be analyzed as soon as possible. For aqueous samples the 40 CFR 136 specifies a holding time of 15 minutes from sampling to analysis. Therefore all aqueous pH samples not analyzed in the field are considered out of hold time at the time of sample receipt. All soil samples are analyzed as soon as possible after sample receipt.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

SC519702 Dry

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:

- [x] Standard TAT - 7 to 10 business days
- [ ] Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 30 days unless otherwise instructed.

Report To: Andrew Adams
Gulf Oil
281 Eastern Ave.
Chelsea, MA 02150
Telephone #: 617 884-5980
Project Mgr: Andrew Adams

Invoice To: Christopher Gill
Gulf Oil LP
80 William Street Suite 400
Wellesley, MA. 02481-3705
P.O No.: _____ Quote #: _____

Project No: _____
Site Name: Gulf Chelsea Terminal
Location: 281 Eastern Ave Chelsea MA State: MA
Sampler(s): Aleksandar Marinkovic

F=Field Filtered 1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11=_____ 12=_____

List Preservative Code below: 2 3

DW=Drinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1=_____ X2=_____ X3=_____

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: VOC Benz/Naphth	PAHs (Benzo(a) pyrene) Naphth	TSS	pH	O&G	Check if chlorinated
SC519702 01	Outfall 003	11-15-18	0735			3									
	Outfall 003	11-15-18					2								
	Outfall 003	11-15-18							1						
	Outfall 003	11-15-18							1						
	Outfall 003	11-15-18					1								
02	TB-1 (Trip Blank)	11-15-18				1									
	TB-2 (Trip Blank)	11-15-18				1									

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? [ ] Yes [ ] No
CT DPH RCP Report? [ ] Yes [ ] No
[ ] Standard [ ] No QC [ ] DQA*
[ ] ASP A* [ ] ASP B*
[ ] NJ Reduced* [ ] NJ Full*
[ ] Tier II* [ ] Tier IV*
[ ] Other: _____
State-specific reporting standards:

* PAHs - Benzo(a) pyrene & Naphthalene only 1

Relinquished by:	Received by:	Date:	Time:	Temp °C
	fridge	11-15-18	0805	Observed .6
fridge		11-15-18	10:56	Correction Factor 0
		11/15/18	16:00	Corrected .6
				IR ID # 1

[ ] EDD format: _____
[ ] E-mail to: * please send report to jennifer.atkins@aecom.com

Condition upon receipt: Custody Seals: [ ] Present [ ] Intact [ ] Broken
[ ] Ambient [ ] Iced [x] Refrigerated [ ] DI VOA Frozen [ ] Soil Jar Frozen

SC51970 Dm

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:

- [x] Standard TAT - 7 to 10 business days
- [ ] Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 30 days unless otherwise instructed.

Report To: Andrew Adams
Gulf Oil
281 Eastern Ave.
Chelsea, MA 02150
Telephone #: 617 884-5980
Project Mgr: Andrew Adams

Invoice To: Christopher Gill
Gulf Oil LP
80 William Street Suite 400
Wellesley, MA. 02481-3705
P.O No.: _____ Quote #: _____

Project No: _____
Site Name: Gulf Chelsea Terminal
Location: 281 Eastern Ave Chelsea MA State: MA
Sampler(s): Aleksandar Marinkovic

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11=_____ 12=_____

DW=Drinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1=_____ X2=_____ X3=_____

G= Grab C=Composite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: VOC Benzene Naphth	PAHs (Benzo(a) pyrene) Naphth	TSS	pH	O&G	Check if chlorinated	QA/QC Reporting Notes: * additional charges may appply
SC51970-01	Outfall 003	11-15-18	0735		SW	3				✓						* PAHs - Benzo(a) pyrene & Naphthalene only 1
	Outfall 003	11-15-18			SW		2				✓					
	Outfall 003	11-15-18			SW				1			✓				
	Outfall 003	11-15-18			SW				1				✓			
	Outfall 003	11-15-18			SW		1							✓		Matrix added per ~~client notified~~ project history
-02	TB-1 (Trip Blank)	11-15-18				1				✓						
-02	TB-2 (Trip Blank)	11-15-18				1				✓					11/16	
					Dm 11/16					Dm 11/16						

List Preservative Code below: 2 3

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☐ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

Relinquished by:	Received by:	Date:	Time:
	fridge	11-15-18	0805
fridge		11-15-18	16:56
		11/15/18	16:00

Temp °C: Observed .6; Correction Factor 0; Corrected .6; IR ID # 1

☐ EDD format: _____
☐ E-mail to: * please send report to jennifer.atkins@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☒ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Batch Summary

1815130

General Chemistry Parameters

1815130-SRM1
1815130-SRM2
SC51970-01 (Outfall 003)

1815132

Semivolatile Organic Compounds by GCMS

1815132-BLK2
1815132-BS2
1815132-BSD2
SC51970-01 (Outfall 003)

1815266

General Chemistry Parameters

1815266-BLK1
1815266-BS1
SC51970-01 (Outfall 003)

1815623

Extractable Petroleum Hydrocarbons

1815623-BLK1
1815623-BS1
SC51970-01 (Outfall 003)

456843A

Subcontracted Analyses

CB99008-BLK
CB99008-LCS
CB99008-LCSD
CB99008-MS
CB99008-MSD
SC51970-01 (Outfall 003)
SC51970-02 (TB-1/-2)

S822832

Semivolatile Organic Compounds by GCMS

S822832-CAL1
S822832-CAL2
S822832-CAL3
S822832-CAL4
S822832-CAL5
S822832-CAL6
S822832-CAL7
S822832-CAL8
S822832-CAL9
S822832-ICV1
S822832-LCV1
S822832-LCV2
S822832-TUN1

S823339

Semivolatile Organic Compounds by GCMS

S823339-CCV1
S823339-TUN1

S823372

Semivolatile Organic Compounds by GCMS

S823372-CCV1
S823372-TUN1